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THE BLACK EMEU.

By Graham Renshaw, M.B.

The group of flightless birds scientifically known as *Ratitæ* will always be of peculiar interest to the naturalist on account of their anomalous condition, which contrasts so strangely with the free-flying powers which the majority of the feathered tribe possess. Indeed, to the popular mind, a bird which cannot fly is almost as great a marvel as a mammal which lays eggs, a predaceous bird which can sing, or a fish which dies if kept submerged in water. The practical naturalist can call to mind familiar instances of all these prodigies in the form of the Australian Ornithorhynchus, the Bechuana Chanting Hawk, and that quaint fish, the West African Mud-Skipper (*Periophthalmus*). The *Ratitæ* are also remarkable for the high development of their running and kicking powers, which have kept pace with the gradual diminution of the wings; so that, although all but apterous, these birds are by no means in a defenceless condition. Then again the ease with which the members of this group can be tamed and tended in captivity renders them most suitable subjects for acclimatization, whilst the large size of many species well adapts them for exhibition in zoological gardens.

The African Ostriches have been so much appreciated for their beautiful plumes that in many districts they are little more than gigantic barnyard fowls, being kept on special farms for the sake of their feathers, besides being protected in the wild state. The East Indian Cassowaries are frequently reared from chickenhood by the natives instead of being exterminated, and must form a considerable item in the stock of those who cater for European menageries, to judge from the great number I have seen offered for sale during the past few years. Far otherwise, alas! is it with the New Zealand Apteryxes and the Emeus of Australia, which tend rapidly to extinction; from the fine appearance and natural docility of the latter birds this decrease in numbers is greatly to be regretted.

Three species of Emeu have been recognized as valid, and it is to these birds that I propose to devote this essay. The Spotted Emeu (*Dromæus irroratus*) is a very elegant bird of slender build, and having its dark grey plumage pleasingly dotted with white, as if besprinkled with dew. This species is easily recognized by its hazel iris. A living example was exhibited at the Amsterdam Zoological Gardens in 1860, and in June of that year a second example, received in exchange from the Rotterdam collection, arrived at the London Zoological Gardens. Two young birds which had been captured on the Swan River were subsequently added to the Regent's Park menagerie. Although it has been ascertained to inhabit Western Australia, but little is known about this rare species.

The Common Emeu (*D. novæ-hollandiæ*) is known by its stouter build, and by its light brown plumage mottled in places with grey; the iris is reddish brown instead of hazel. This species is so well represented in zoological gardens and museums that most persons will be familiar with its appearance. Special interest attaches to the Common Emeu as being the largest of all living birds save the Ostrich.

It is a remarkable fact, that many animals conspicuous for their size, are related to others whose dwarf forms seem almost like miniature reproductions, fashioned by nature in a fit of whimsical caprice. For instance, although the recent species of Elephant are the largest of all terrestrial mammals, there have been discovered in the caverns of Malta the remains of pigmy Elephants, closely related to the living African species, yet not exceeding three feet in height! Similarly the great *Hippopotamus major* of Britain, now known only by its fossilized bones,

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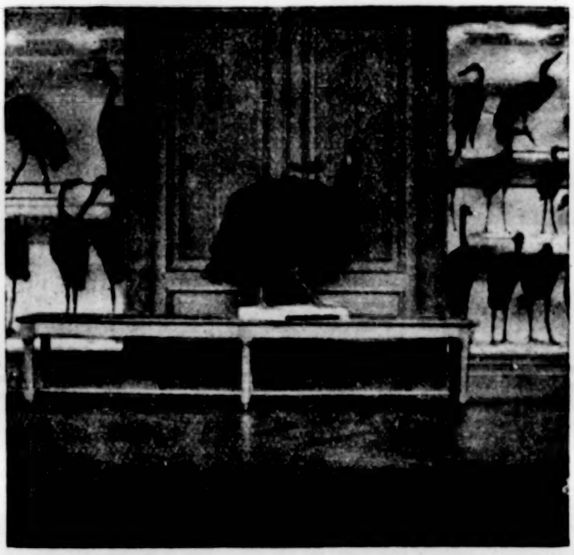
was formerly represented in Cyprus by the little *H. minutus*—the "petit hippopotame fossile" of Cuvier. Again, the Common Hippopotamus of the African rivers has to-day a dwarf congener (no larger than a heifer) occurring in Liberia. The Common Emeu is no exception to the rule, for this great bird had once a pigmy cousin which occurred on Kangaroo Island, off the south coast of Australia, and was found nowhere else. This dwarf or Black Emeu has unfortunately been utterly exterminated, and is so rare in museums that but one stuffed specimen and two skeletons are certainly known to exist. A hundred times rarer than the lamented Great Auk, this vanished *Dromæus* is well worthy of the detailed attention which we now proceed to devote to it.



Black Emeu (*Dromæus ater*) in the Jardin des Plantes Museum, Paris. The only stuffed example known.

The Black Emeu (*D. ater*) was about the size of a large Bustard. In addition to its diminutive proportions, it was remarkable for the curious overdevelopment of its plumage, the elongated feathers hanging loosely about it, as if too ample for the body which they covered. An examination which I made of the Paris specimen a few months ago showed that the general colour of the plumage was blackish brown, the individual feathers being brown for about two-thirds of their length, with a blackish-brown tip. The crown of the head was quite black, as were also the feathers of the neck and throat. The legs of the Black Emeu during life are said to have been of a dirty bluish colour, but I found that in the dry state they did not materially differ from those of a Common Emeu, with which I compared them at the time. According to Latham, *D. ater* had the iris of a brown colour, thus resembling the common species rather than *D. irroratus*.

The history of the Black Emeu is soon told. In 1803 a French scientific expedition under Captain Baudin landed on Kangaroo Island. Baudin himself took a great interest in natural history, and had sent a rich collection of specimens—both zoological and botanical—to the Jardin des Plantes only a few years previously. On this occasion he had the valuable assistance of Péron, the celebrated zoologist, and it is to the work of this expedition that scientific Europe is indebted for almost all its knowledge of the Black Emeu. Kangaroo Island was uninhabited by man, but abounded in the marsupials from which it took its name, and there were also great numbers of *D. ater*—"Casoars," as the Frenchmen called them. By a happy chance it was determined, if possible, to bring away some of the pigmy Emeus alive; had it not been for this haphazard resolution, the species we are now considering would probably never have been known at all to naturalists. Three birds were taken alive, and it speaks well for the intelligent care taken of them during the long voyage home, that they all arrived safely at Paris in 1804-5. One of these Emeus was placed in the menagerie of the Jardin des Plantes, where it continued to thrive for many years; the other two, with a Zebra, a Monkey, and a large collection of plants, were destined for the Empress Josephine. The Empress's Emeus were sent to her residence of La Malmaison, and at their death one of them—indeed, probably both—was placed in the Jardin des Plantes Museum.

It is interesting and indeed satisfactory to note that the Black Emeu, rare as it was, did not become extinct before specimens had been brought alive to London and examined by an English ornithologist. Dr. Latham tells us that a pair which he saw some time previous to 1822 were remarkable for the looseness of their plumage, which was so long as to conceal the thighs. They carried themselves in true Emeu fashion, with protruding breast and retracted head—a stately mode of progression which may be studied in the Common Emeu by observation at the Zoo. In Latham's day the distinctions between the various ratite birds had not been worked out; he called *D. ater* "Van Diemen's Cassowary," but evidently recognized it as a valid species, pointing out that it was always smaller than *D. novæ-hollandiæ*, which he styled the "New Holland Cassowary."

Latham says that the two birds he saw were of a tame disposition, and it is highly probable that the Black Emeu was as capable of being semi-domesticated as the common species, which now breeds in many an English gentleman's park. The three examples brought from Kangaroo Island stood the climate of France well enough; one of them lived from 1804 to 1822, and when it died was still in splendid condition, as an examination of its stuffed skin will testify. Indeed, these birds might have been easily acclimatized in Europe, and perhaps the founding of a menagerie-bred race would have ensured the permanent continuance of the species independent of any calamity that might happen to the wild individuals which had been left on their native island. *Dis aliter visum.* The Black Emeu has been utterly exterminated, and, indeed, has disappeared so completely that it should not be ranked with the "commoner" extinct birds, of which a considerable number of museum specimens yet remain—the Great Auk and the Labrador Duck, for instance. It should rather be enrolled in the "almost unique" series of exceedingly rare forms, such as the Black and White *Fregilupus* Starling of Réunion, or Pallas's Cormorant.

Bullock and Latham alone, amongst the early naturalists, appear to have certainly recognized the Pigmy Emeu as distinct from the common species. Mr. Bullock will be chiefly remembered by naturalists as being one of the few ornithologists who ever had the chance of chasing a British Great Auk, and many will remember how he is related, in 1812, to have pursued the male bird, now in the National Collection, for several hours in a six-oared boat without success. It appears that the Bullock museum contained a specimen of the Common Emeu, and also of the "Lesser Emeâ, not half the size of the above, and a distinct species." Since Bullock's day no more Black Emeus seem to have been sent to Europe, and for many years this interesting dwarf remained practically forgotten. At length ornithologists realized that *D. ater* was a perfectly distinct bird from any of its congeners, but the discovery came too late. In the interval a squatter had taken possession of Kangaroo Island, and this man, whose wanton waste of animal life cannot be too severely condemned, barbarously exterminated both Kangaroos and Emeus; so that the little "casoar" of Baudin and Péron disappeared utterly from the face of the earth.

A census of the few relics left to us will complete this obituary notice. I have included all the specimens—a scanty list at best—of which I have been able to find any record whatever. They are as follows:—

1. A stuffed specimen—possibly the only one now in existence—is preserved in the Natural History Museum of the Jardin des Plantes. It was one of the three individuals brought home by Captain Baudin, and, independent of its known history, has evidently had a long *post-mortem* existence as a museum specimen, for it has been provided with the old-fashioned circular glass eyes formerly used with rare impartiality for bird and beast, carnivore and herbivore, by the old taxidermists. On account of the rarity of the Black Emeu in museums some naturalists still appear to cling to the idea that it is identical with the common species, just as some authorities once believed that the South African Blaauwbok was only an immature or dwarf Roan Antelope. This specimen, however, was not set up till 1822, and after all it will be granted that eighteen years gives the feeblest menagerie specimen ample time to become adult; besides, if *really* feeble, it would probably not have survived for so long! It is indeed evident that when the bird died it was in excellent plumage, and this mounted specimen to-day shows no signs of disease. We may reasonably conclude that it is an excellent typical specimen of the average size, and in every way a good representative example of *D. ater*. I am inclined to think that this bird was a female. It is satisfactory to note in the looseness of the plumage (see illustration) a confirmation of Latham's account, for he drew attention to the fact that in

"Van Diemen's Cassowary" the thighs were quite concealed, whereas in the common species they were visible enough. To sum up, the Black Emeu is distinguished from *D. novæ-hollandiæ* by:

(*a*) Its smaller size.

(*b*) The greater development of the plumage, which hangs down behind almost like a train.

(*c*) The *colour* of the plumage brownish black, the Common Emeu being a much greyer bird.

An excellent custom prevails at the Jardin des Plantes Museum, for officials are stationed about to explain objects to visitors; to one of these gentlemen, indeed, I was much obliged, for it was he who with evident pride pointed out to me the "emeu noir," besides showing me a famous specimen of an extinct Pigeon (*Alectorænas*, I think), and other rarities. There are, indeed, few museums where the attendants take such trouble to befriend visitors, or show such an educated interest in the objects under their care.

2. The skeleton of another of Baudin's specimens was prepared in 1822, and placed in the museum of comparative anatomy connected with the Jardin des Plantes.

3. A third example—probably the remaining Emeu of Baudin's three birds—was prepared as a skeleton previous to 1833, and is now in the Royal Zoological Museum at Florence. It is a male specimen, and probably originally came from the Paris collection.

4. At the sale of the Bullock Museum in 1812, the Linnean Society purchased the "Lesser Emeâ" for £7 10s. Unfortunately all trace of it has been lost.

5, 6. A pair of "Van Diemen's Cassowary," exhibited in London—perhaps in the old menagerie of Exeter 'Change—was seen, as already related, by Latham; and one of the birds is grotesquely figured on plate cxxxviii. of his 'General History of Birds,' published in 1822. Nothing is known of the fate of these birds; perhaps their remains are still unrecognized in some provincial museum.

The above list practically completes all that can be said about the Black Emeu. It seems possible, however, that further specimens might be found by a systematic search in the museums of Europe, and also in those of Australia, New Zealand, and Tasmania. It must be remembered that the *skins* of two of Captain Baudin's Emeus have not yet been accounted for. This pigmy species seems very likely to be overlooked, being mistaken for a young example of the Common Emeu; but a small yet *fully adult* specimen (as indicated by the state of the beak, legs, and feet) could surely be easily identified as the true *Dromæus ater*, and should this communication cause a search to be instituted, resulting in the discovery of any hitherto unrecognized specimens, it will not have been written in vain.

ORNITHOLOGICAL NOTES FROM CO. DONEGAL.

By W. C. Wright.

Until quite recent years Donegal was, practically speaking, an unknown part of Ireland, but now, thanks to the splendid system of light railways and well-organized coaching tours, one can visit the most remote part with a more or less degree of comfort.

During the latter part of June and beginning of July (1902) I spent several weeks in visiting some of the breeding resorts of the sea-fowl on the coast and adjacent islands. Starting from Donegal town, you reach the terminus Killybegs by rail, whence the one hundred miles coach tour starts, by taking which one can inspect at leisure the whole seaboard right round to Rosapenna.

Killybegs stands in a land-locked lough, in which are several small islands. On some I visited were found large numbers of Arctic Terns (*Sterna macrura*) nesting; some of the nests were the best attempts at building I have seen, being lined with straw and seaweed. Most of the young were hatched (June 30th), but in several nests I noticed the full clutch of eggs. Ring Plovers were also nesting here; the eggs were to be found at high-water mark on the bare shingle, no materials of any kind being used.

Carrick. — From here I visited Rathlin O'Birne island, a lighthouse station, and the most westerly point of Donegal. Storm-Petrels (*Procellaria pelagica*) were breeding there in large numbers; the eggs I found on the bare ground among large boulders. The female birds were easily captured by the hand, and in every case, when handled, they emitted the peculiar oil, which, to me, diffuses a pleasant odour. The other birds nesting there were Oystercatchers, Herring-Gulls, and a pair of Great Black-backed Gulls; and, according to the light-keeper, a pair of Choughs had successfully hatched out and brought up a clutch of four eggs this season. During my stay at Carrick I ascended Slieve League, and was shown the eyrie of a pair of Golden Eagles (*Aquila chrysaëtus*), where they had been successful in bringing up a brood this year. The owner of this estate, Sir James Musgrave, Bart., has, I am happy to say, instructed his keepers to protect this noble bird. Ring-Ouzels (*Turdus torquatus*) were very numerous on the mountain; but I searched in vain in hope of finding a nest. Wheatears (*Saxicola œnanthe*) were also numerous.

Ardara.—During a few days spent here fishing on the Owenea River, I saw large numbers of Common Sandpipers (*Totanus hypoleucus*)—they were probably nesting—as well as Grey Wagtails (*Motacilla melanope*); at the mouth of the river Black-headed Gulls, Common Terns, and Curlews were feeding. In the Woodhill demesne here several pairs of Spotted Flycatchers (*Muscicapa grisola*) were nesting, as well as numerous pairs of Chiffchaffs and Willow-Warblers.

Dungloe.—The centre of the district known as the Rosses is perhaps the most desolate part of Co. Donegal; it consists of a region of rocks, hills, and numerous fresh-water loughs (where you can get the best of both Brown and White Trout fishing) on the mainland, and of rocky islands lying off its shores. The largest of the islands are thinly covered with peat and moss, and a few are cultivated to a slight extent. Aranmore, the largest, some 4335 statute acres in extent, I visited from Burtonport, landing at several parts during my sail round the island. I was fortunate in securing very intelligent boatmen, who were well informed on the birds of the island; they told me this was a stronghold of the Chough (*Pyrrhocorax graculus*), but unfortunately, even in this remote district, the commercial value of the eggs is known, and few are allowed to bring out their young unmolested. I was shown, in a cave, one nest which had been robbed by an old woman who lived close by, and who visited the nest every morning until the full clutch of eggs were laid, of which she knew the value; she had, however, to keep them for months unblown before a purchaser came along, who gave her thirty shillings for the four eggs. It is little wonder that this bird is becoming so scarce when such a premium is offered for the eggs. On the north and north-east coast I found large colonies of Common Guillemots, Razorbills, and Puffins breeding, and I was also able to make out with glasses a few Black Guillemots (*Uria grylle*) and Manx Shearwaters (*Puffinus* *anglorum*); these latter were fairly numerous, and, as it was the first time I had seen them in their native haunts, I was very pleased, more especially when their identity was set at rest by one of the boatmen producing some of their eggs which he had taken the previous season. Rock-Pigeons (*Columba livia*) were breeding in large numbers in the numerous caves on the east coast; in one cave in particular they were so numerous that, on entering, I sank almost to the knee in their droppings. These caves are visited periodically by the islanders, who take the guano away in bags, and either use it on their own potato-patch or sell it on the mainland. On the west of the island, where the cliffs are some 500 ft. sheer down to the sea, Shags (*Phalacrocorax graculus*) were nesting in every conceivable fissure in the rocks. With glasses you could see the young birds straining their necks over the edges of their nests. I was fortunate to get a good view of a pair of Peregrines (*Falco peregrinus*) as they flew out from the cliffs uttering their screaming cry. One of the light-keepers told me that three pairs nested on the island this year, and that he had taken the young birds from one of the eyries.

Herring-Gulls (*Larus argentatus*) have a station at Rintaross Point, and were breeding there in large numbers.

At Roanish, a small rocky island to the south of Aranmore, Storm-Petrels (*Procellaria pelagica*) were breeding in even larger numbers than on Rathlin O'Birne; they are quite unmolested there, as there is no lighthouse station on the island.

During a fishing expedition on Dungloe Lake (July 10th) I had the good fortune to make my first acquaintance with the Red-throated Diver (*Colymbus septentrionalis*). The bird was seen circling overhead by my boatman (who was well acquainted with the species), as if going to alight, but on seeing us it took alarm, and made for a small mountain lough further up, where a pair have nested for years. The boatman informed me he has taken the eggs from this lough for several seasons, where the nest is placed on a small islet, and, as there is no boat, one has to swim out to it. This year he took the first and second clutches of eggs, and allowed the third to be incubated, and on one occasion he took three clutches, but still the poor birds were undaunted, and laid a fourth. He says one egg is always addled; I think it is little wonder after such persecution, and have no doubt if the first lot were left they would both prove fertile. I had the pleasure of seeing this pair and their solitary young one on the lake; they come down by easy stages from lake to lake until they reach the sea.

On fishing expeditions I visited most of the larger of the Rosses Loughs, and, as they are studded with small islets, they were the favourite breeding-ground of innumerable Terns, Common and Arctic; and on one lough (Alecmore) I found a large colony of Common Gulls (*Larus canus*) with their young, who were now fairly strong on the wing, and able to swim well. A pair of Red-breasted Mergansers (*Mergus serrator*) inhabit this lough; I discovered the nest among a clump of brambles on an islet, and it contained about ten eggs, which were well covered up with down.

At Crohy Head (where some ships of the Spanish Armada were wrecked) I found a nest of the Kestrel (*Falco tinnunculus*) with young; the nest was in a very steep part of the cliff, but easily seen from above by leaning over the edge; it is close by here that the soap-stone quarries are situated, but owing to the unsafe anchorage for vessels the quarries are not now worked.

Dunfanaghy.—This is the stopping-place for the unrivalled promontory of Horn Head. I had only one day to spend here, so visited it on foot from the mainland, although the best way to see its full magnificence is by boat. Accompanied by Strain, the cragsman, I was shown the site of three eyries of the Peregrine (*F. peregrinus*), from two of which my guide had taken the young Falcons, and sold them for one pound apiece. The remaining nest had baffled all his efforts to approach, as it was protected by an overhanging rock, and consequently he could not swing himself into it by a rope from above. I lay above this eyrie and watched the parent birds, who sat on a cliff opposite, and afforded me the pleasure of a good view through my field-glasses. Strain tells me all the young Peregrines hatched on the Horn are driven away by the parent birds for nesting-sites to the Muckish Mountains, where, he says, he also goes for young Falcons. The innumerable quantities of seafowl which inhabit the Horn baffle all description. I found Puffins, Razorbills, Common Guillemots, Kittiwakes, Herring-Gulls, each on their own allotted ledges, busy in their work of incubation, or feeding their young. Strain, who is a fearless climber, descends the cliffs by the aid of a rope every season, and takes a large number of eggs. This he has permission to do from the landlord, on the understanding he leaves the second lot of eggs to be hatched. He holds there is a distinct species in the Ringed Guillemot (*Uria ringvia*), and during the season comes across their eggs on the same ledges as the Common Guillemot; some eggs he showed me, however, could not be distinguished from some of the eggs of the last-named species. I am glad to say the Chough is being protected here, and two broods were reared this year. I was sorry my time was so limited, else I would have visited Tory Island, which lies some seven miles out at sea, and have no doubt would have been amply repaid.

I cannot better conclude than by quoting Thompson in his 'Birds of Ireland,' who, on visiting Horn Head, says:—"By the philosophical student of Nature, however, the mighty scene before him, comprising earth, ocean, sky, each in its sublimity, will be considered before he turns his attention to its beautiful adjuncts —the feathered race."

NOTES AND OBSERVATIONS ON THE MAMMALS COLLECTED AND OBSERVED IN THE DARBHANGA DISTRICT, TIRHOOT, BENGAL.

By Gordon Dalgliesh.

The following mammals are those which came under my notice during a three years' residence in the above district. I am aware that the list is sadly deficient in the smaller mammalia, as Mice, Bats, &c., and if the district was efficiently worked, it would, I feel sure, yield many more species.

Macacus rhesus, Aud. (Bengal Monkey).—Very common in the wilder and more wooded parts of the district. They do great damage to the native crops at certain seasons. They are very easily tamed when taken young. One that my father had some years ago was very attached to a dog, hardly ever leaving its side, and when the dog took a walk the monkey would ride on its back. Another one I heard of had a great liking for whisky, and would help himself out of the glasses at table. They generally go about in small parties. They are regarded as sacred by the Hindoos.

Semnopithecus entellus, Dufr. (Langú).—This fine Monkey is not very common. One used to visit Dalsingh Serai Factory periodically for some years, and was not at all shy, but would almost take food from one's hand. It is also sacred to the Hindoos.

Felis chaus, Güld. (Jungle Cat). — One or more are nearly always to be found in grass and thorn jungle, and I very often turned them out of the drains that ran under the indigo-vats at Hattowrie and Dalsingh Serai Factories. They show fight remarkably well when tackled by dogs, and run swiftly and climb well. They breed about March in those parts, as I have seen very small kittens in April and May. They are exclusively carnivorous in their tastes and bloodthirsty, and, if they once find their way into a fowl-house, will not leave a bird alive. I have several times caught them in traps baited with putrid meat that were really set for Jackals.

Viverra zibetha, Linn. (Large Indian Civet).—I have never seen this species alive, but saw one or two skins that were *said* to have been procured in the district.

Viverricula malaccensis, Gmel. (Small Indian Civet).—My friend Mr. C. M. Inglis has informed me he has procured this species in the Madhubani Sub-Division Darbhanga, but I never came across it myself.

Paradoxus niger, Desm. (Indian Palm Civet).—Very common. I have twice shot this species, while it has been in the garden after fruit, of which it is very fond. They have a very disagreeable odour when excited.

Herpestes mungo, Gmel. (Common Mungoose).—Abundant everywhere. When taken young it becomes exceedingly tame, and makes an amusing pet. One I had was very fond of fish, and would devour a dozen small ones 3½ in. long at a meal, and have eaten more had I given it. They will also eat frogs, insects, and snakes, and also at times will kill rats. I think they breed in May and June, as I have had very small ones brought to me during those months.

Canis pallipes, Sykes (Indian Wolf).—Rare. Solitary examples occur from time to time. One was seen in a village a few miles from Hattowrie in June, 1901.

Canis aureus, Linn. (Jackal).—Very common. Found during the cold weather among sugar cane and long grasses, but in the hot weather they resort to their earths, usually among grass jungle. Their food consists of carrion, smaller animals, and birds. They are very tenacious of life, and I have seen one recover from a severe blow on the head—that would have killed most animals—and attempt to escape. I have often caught them in a large box trap baited with a dead fowl. Four young ones were dug out of an earth at Hattowrie in April, 1901, and I tried to rear them, but they all died after a few weeks. During the time I had them they were very quiet by day, but at nightfall commenced to whine dismally. The cry of the Jackal is one of the most weird sounds I have ever heard, and is said by Europeans in India to resemble the words, "a dead Hindoo."

Vulpes bengalensis, Shaw (Common Indian Fox).—Abundant throughout the district. Their earths are situated as a rule in open fields and have several openings to them. This pretty little Fox is by no means shy, and often comes close to houses. Their cry is a chattering bark, and during the breeding season they make a squealing (or half snarl, half squeal) sound quite unlike their usual cry. They are at this time very bold, and on one occasion a vixen with cubs turned on a dog which was chasing her and caused him to beat a hasty retreat; twice this performance was repeated. The young are born from February to April. They do not appear to live on carrion as does the Jackal, but on fruit and large locusts; the wings and legs of these insects I have often seen scattered about the mouth of their burrows. I once saw one which deliberately deceived myself and the dogs by appearing to be lame and limping on three legs until the dogs were within a few yards; then it went off at full speed, proving there was nothing wrong with it.

Mustela flavigula, Bodd. (Indian Marten).—One was killed at Hattowrie Factory in April, 1898, and two at Dalsingh Serai in May, 1900. These animals had a most unpleasant odour, which was perceptible many yards distant from where they lay.

Lutra vulgaris, Erxl. (Common Otter).—Common, especially so round Hattowrie and Russelpur. A dog Otter, killed at Hattowrie in May, 1901, was lying in a drain near a small pond and was driven out by the dogs. Two half-grown young were caught in the reeds of Hattowrie Lake in the same month. They were very fierce and bit furiously when handled. A fine male, killed at Russelpur Factory in November, 1898, weighed 28 lb. When taken very young they are easily tamed, and some of the natives train them to catch fish.

Crocidura cærulea, Kerr (Grey Musk Shrew).—This little animal, commonly known to Anglo-Indians as "Musk Rat," is very plentiful. They are common in most dwelling-houses. Their cry is very sharp and ear-piercing. They have a curious habit of running round the room as close to the walls as possible. Their food appears to consist of insects, but some naturalists have said they will eat frogs and young birds.

Pteropus medius, Temm. (Indian Fruit Bat).—Very common during the rainy season, but I have not often noticed it during the cold weather. Numbers used to come to Dalsingh Serai Factory towards nightfall and settle on the fruit trees. They never came all at once but singly or in pairs, flapping slowly after each other. Before alighting on the tree, they always flew slowly round once or twice. The late comers were invariably ejected by their more fortunate earlier companions, and then much flapping and screeching took place. On the road to Begum Serai is a large dead cotton tree, which is always covered during the day by hundreds of these Bats roosting. They are known to Anglo-Indians as "Flying Fox."

Rhinolophus affinis, Horsf. (Allied Horseshoe-Bat).—I found this Bat very common at Dalsingh Serai. They frequent old buildings and drains during the day.

Megaderma lyra, Geoffr. (Indian Vampire Bat).—I found this Bat fairly common at Dalsingh Serai, but did not observe it elsewhere in the district. My specimens were all taken from an old barn, from the rafters of which they used to hang during the day. I once had a whole cage of small birds (Munias) killed by one of these Bats, which got in during the night.

Vesperugo abramus, Temm. (Indian Pipistrelle).—Abundant everywhere. This I found to be the first Bat to appear in the evenings. Numbers used to frequent the bamboos in the roof of my bungalow in the daytime.

V. serotinus, Schreb. (Serotine). — It is with some hesitation I add this species to my list, but I caught a Bat at Hattowrie in August, 1901, that I am nearly sure was this species. It was in poor condition and most of the fur worn off the belly. It measured: head and body, 2·4 in.; tail, 1·1 in.; forearm, 4 in.; hind foot, ·4 in.

Cerivoula picta, Pall. (Painted Bat).—I once procured several of this species at Dalsingh Serai in the cold weather of 1897. They were taken from under the beams of an old bridge that was being repaired. The females had naked young clinging to them.

Sciurus palmarum, Linn. (Palm Squirrel).—Very common in most parts of the district, scarce or entirely wanting in others. This is perhaps one of the most familiar of Indian mammals, and its naturally fearless nature makes it an amusing pet. They feed chiefly on fruit and occasionally rob birds' nests. A pair that used to live in the roof of my bungalow became very tame, and would jump on to the breakfast table when no one was there and eat the crumbs. I have had young brought to me throughout the hot weather, so I presume they have several litters in the year. Their alarm cry is a sharp twittering sound, very birdlike.

Gerbillus indicus, Hardw. (Indian Gerbille).—Very common. It makes extensive burrows in open fields and cultivations. The young are born in January and February, generally three to four at a birth. I procured many of this and other species by flooding their burrows with water. I once took nearly half an ordinary sack of wheat from one of their burrows. They run extremely swiftly, very often using only the hind legs and springing like a Kangaroo.

Vandeleuria oleracea, Benn. (Long-tailed Tree Mouse).—I have never come across this species myself, but Mr. C. M. Inglis says, writing about the Black-throated Weaver bird (*P. bengalensis*): "Many eggs are destroyed by the pretty little Longtailed Tree Mouse. I have several times caught it in these birds' nests."

Mus alexandrinus, Geoff. (Black Rat).—This Rat is common everywhere.

M. decumanus, Pall. (Brown Rat). — Common, but not, I think, so much as *M. alexandrinus*.

M. musculus, Linn. (House Mouse).—Only too common.

M. buduga, Gray (Indian Field Mouse).—I caught only one specimen of this pretty species at Dalsingh Serai in August, 1901. I found it in an indigo-vat, brought in evidently with the plant. No doubt it is common.

Nesocia bengalensis, Gray (Mole Rat). — Very common. Its burrows are always well marked by the heaps of earth thrown up round the mouth of them. Above ground it is slow in its movements, and one I had under observation attempted to bite savagely when handled. The specimen I had was kept in a very thick wooden box, but it gnawed its way out one night and so escaped. It seemed very sensitive of light and always chose the darkest part of the box. This species, with other rats and mice, forms one of the articles of food of a certain caste of natives known as "Moosoores."

Hystrix leucura, Sykes (Indian Porcupine).—Common, but being nocturnal in its habits, they are not very often seen. They make extensive burrows, and in one place I saw a barn that had been completely undermined and the flooring destroyed by these animals. They do considerable damage to fruit and vegetables. One ate a whole row of pineapples in a garden which I knew. I had some young a few weeks old brought to me at Dalsingh Serai in July, 1901. Young Porcupines, when roasted, are considered great delicacies by some people, but I never could make up my mind to eat one myself.

Lepus ruficaudatus, Geoffr. (Common Indian Hare).—I found this species fairly common at Hattowrie in fields of young sugar cane, and have had young brought to me at Dalsingh Serai, which I tried to rear, but they always died after a few days.

Bos gaurus, Ham. Smith (Gaur).—Mr. Inglis had a young bull brought to him, which was caught in the Madubani Sub-Division.

Boselaphus tragocamelus, Pall. (Nilgai).—The Nilgai are not uncommon in certain parts of the district. I once saw a young tame male. A curious fact about this one was, that it had a great liking for the smell of cigar smoke, which, if blown into its face, it would eagerly sniff up. It would also eat cigars and paper if offered to it.

Cervus axis, Erxl. (Spotted Deer).—An occasional visitor to the wilder parts of the district.

Sus cristatus, Wagn. (Indian Wild Boar).—Abundant wherever there is any heavy jungle. A number were nearly always to be found in some large grass jungle near Hattowrie. They are very fond of wallowing in mud, and such places where they have been are often met with. They come into gardens occasionally to eat the vegetables. Pig-sticking is a favourite sport with Europeans in this district.

Platanista gangetica, Lebeck. (Gangetic Dolphin).—I have occasionally seen this species on the Keray River, near Hattowrie.

THETFORD WARREN.

By W. G. Clarke.

Thetford Warren, in the parliamentary division of North-west Suffolk, but for administrative purposes included as part of the borough of Thetford, in the county of Norfolk, is interesting not only for the extent and variety of its bird-life, the arid wildness which for more than a century past has been its characteristic, and the rare plants and insects that here have their habitat, but also for the indications it gives of the varying economic value and utility of a certain area of land. It is slightly less than three thousand acres in extent, and the number of neolithic flint implements found on its surface prove that the district must have been populous in later prehistoric times. One of the rarest and most exquisitely worked neolithic implements ever found in the locality was a double-edged flint saw less than two inches in length, with nearly thirty teeth on each edge, which was picked up from a rut in a sandy trackway near the middle of the Warren. There is a tradition of a "white horse" cut on the rolling slopes of the East Anglian Heights within the vicinity of the Warren, but the exact spot is not now ascertainable. In early times, probably before the Norman Conquest, portions of the Warren were arable land. In 1274 the Cluniac prior at Thetford was returned to furnish, at his own expense, ten archers for forty days, whenever the king went against the Welsh in person. The land for which this service was rendered was part of Thetford, or, as it was then termed, Westwick Warren. In the sixteenth century it was almost devoted to profitable pastures and fold-courses, and was also a favourite locality for "Kite-hawking." There is no record of a Kite having been killed on the Warren since 1857. Writing in 1622 of the junction of two streams less than a mile from the Warren, Drayton said:—

> "Where since their confluent floods so fit for hawking lye,
> And store of fowl intice skill'd Falconers there to fly."

All the meadows bordering the lighter soil of the Warren appear to have been Lammas Meadows until the Enclosure Act of 1806, when they and the Warren were allotted to private owners.

Until the early part of the nineteenth century this area was chiefly valuable as arable and pasture land, and possibly the Warren Lodge, a quaint building almost on the highest point of the Warren, was built by the monks to guard their crops in this lonesome spot. The walls of the older part of the building are over three feet in thickness, the only entrance is by a narrow doorway, and the solitary window on the ground floor is a mere slit in the wall. One room contains the apparatus for drying Rabbit-skins, although the process has long been discontinued. Large numbers of traps, nets, and huge lanterns used by former warreners, are also preserved, but the man-traps at one time stored here have been removed. In one corner of the ancient room on the first floor is a stone cell with a niche. A tube about six inches square, in the thickness of the wall, runs downwards from this room to the porch, presumably for verbal communication at night. The spiral staircase is of stone, very low and very narrow, while the ancient well—in what was probably at one time the courtyard—is 103½ ft. deep.

In the middle of last century the Warren was a treeless waste devoted entirely to Rabbits. Its aspect at that time is well depicted in the second volume of Stevenson's 'Birds of Norfolk.' The scene was sketched on the spot about 1868 by Mr. James Reeve, now the Curator of Norwich Castle Museum, and the Heron, Stone Curlews, Lapwings, and Rabbits were "painted in" by Mr. Joseph Wolf, the noted zoological artist. It is probable that Rabbits have for centuries been more or less common on some parts of the Warren. Mr. J. D. Salmon, F.L.S., crossed the Warren in March, 1837, to see the new stock of Rabbits from Lincolnshire. They were commonly known as "silver-greys" or "silver-sprigs," and their fur was much more valuable than that of ordinary breeds. About 1870 twenty thousand Rabbits were annually sent from this Warren to London, but the variety is now virtually extinct in the district, and the ordinary grey and black Rabbits have greatly decreased since they ceased to be properly tended in winter. Yet the locality has still an undoubted attraction for Weasels and Stoats. In

1893 two hundred of the latter were trapped in six weeks, and in the following year one hundred in fourteen days. During the past twenty years hundreds of acres have been planted with trees, and the general appearance of the Warren has thus been entirely altered. Most of the remaining portion is covered with stunted herbage and lichen, and in summer by bracken, heather, and short grass.

Until this attempt at afforestation, even in a district remarkable for its wildness—there are twenty large heaths within six miles of Thetford—the Warren was pre-eminent. Plants, insects, and birds whose usual habitat is the sea-coast are here found inland, having probably survived from the time when a strait divided Norfolk from the rest of East Anglia in the post-glacial epoch. Two or three plants of the sand-dunes still grow plentifully; eight species of Lepidoptera usually confined to the vicinity of the sea are more or less common; and a small class of moths is practically confined to this district, owing to their caterpillars' food-plant being found only in the vicinity. *Helix virgata* and other species usually considered littoral are found on the same heaths and warrens. Thetford Warren is one of the very few inland nesting-places of the Ringed Plover. Their return in the spring is probably due to hereditary instinct transmitted through countless generations. They were "very abundant" at Thetford in 1836, but of late years the number of pairs nesting in the locality has been extremely limited. A few Dunlins and Dotterel are observed on the Warren almost every year; Golden Plover have been seen at odd times; and it is one of the last strongholds of the Stone Curlew. The first Stone Curlew described to science was one killed in the neighbourhood of Thetford in 1674, and forwarded to Ray by Sir Thomas Browne. About Christmas, 1861, a Little Bustard was caught in a Rabbit-trap on the Warren, and there is reason to believe that a nest found here in 1832 was the last of the Great Bustards in Suffolk. The Bustards were probably as numerous here as anywhere in England, and it is unfortunate that those which Lord Iveagh endeavoured to naturalize in the adjoining parish of Elveden should have wandered in another direction, and not taken up their abode on these wastes, where safety would have been practically assured. A somewhat similar attempt was made in 1885 to acclimatize Black Grouse, but the half-dozen turned out in the autumn did not survive the winter. Pheasants and both species of Partridge are common. The Stock-Dove nests in Rabbit-holes with comparative frequency, and it is probable that at one time the Common Sheld-Duck also occupied similar quarters during the nesting season. The Wheatear, which usually arrives on the Warren about March 25th, is very common. Sand-Martins frequent the chalk-pits—one of which was in existence five hundred years ago—and Common Snipe nest on the low-lying meadows. In April, 1893, the writer counted sixteen gyrating at one time over the marshy parts of the Warren. Although there is no actual record of the occurrence, it can hardly be doubted that the Short-eared Owl has nested, and does occasionally nest, on Thetford Warren, for its eggs have been found in similar localities but a mile or two distant. Lapwings have decreased in number of late years, chiefly owing to those who consider their eggs a delicacy, and so make collecting profitable. Among the occasional visitors to the Warren are Peregrine Falcons, which may almost be classed as annual visitants, and Pallas's Sand-Grouse. A large flock of the latter was observed in 1863. The Marsh-Harrier has been shot; Rough-legged Buzzards secured at various times (undoubtedly many more than those of which we have record); two White-tailed Eagles were trapped in the winter of 1832–3; and in December, 1846, a Hoopoe was here found dead. An immature Falcon was killed on this Warren in the spring of 1883, and, although there is great difficulty in differentiating the Iceland Falcon and the Scandinavian Gyr-falcon in this state of plumage, it was eventually assigned to the latter species. On this occurrence rests its sole right to be included in the Norfolk list.

NOTES AND QUERIES.

MAMMALIA.

The Dormouse in Cardiganshire.—I was not aware of the occurrence of this little animal (*Muscardinus avellanarius*) in the Aberystwyth district until the 16th of June last, when I found, in a furze-bush, a nest, much like a Wren's nest, but more nearly spherical, and had a good view of the occupant, as it emerged upon my inserting a finger. I shortly afterwards found a similar nest in a locality some three miles distant, so it is quite possible that this species may be not uncommon in North Cardiganshire. — J. H. SALTER (University College, Aberystwyth).

AVES.

Variety of the Hawfinch.—A very pretty variety of the Hawfinch (*Coccothraustes vulgaris*) was shot at Bramford, near Ipswich, about Feb. 8th. It is an adult male, having the wings and tail nearly white, the back pale cinnamon-brown, and the throat-patch sooty grey. I have only seen one other variety of this species, and this was in the collection of the late Mr. F. Bond.—JULIAN G. TUCK (Tostock Rectory, Bury St. Edmunds).

The Status of the Goldfinch (Carduelis elegans) in Britain (*cf. ante*, pp. 23 and 70).

Brecon.—A fairly common resident, nesting sparingly all over the lowlands of the county, and occurring in small flocks on waste lands in autumn and winter. The district adjoining the north shore of Llangorse Lake is a favourite haunt in summer. — E. A. SWAINSON (Woodside, Brecon).

Denbighshire.—Common as a breeding species all up the Ceiriog Valley and adjacent country.

Carnarvonshire.—Sparsely distributed in the Lleyn peninsula, and resident.

West Cheshire.—A few odd birds frequent the Dee Cop in hard weather every year. Rare in summer. — S. G. CUMMINGS (King's Buildings, Chester).

Somerset (*Western District*).—Resident, not uncommon, assembling in flocks on the moorlands at approach of autumn. Steadily increasing during late years, and would become *very* frequent were it not for the bird-fanciers, who catch hundreds in a season (autumn and winter).—STANLEY LEWIS (Wells, Somerset).

Cambridgeshire.—Formerly it used to be very abundant, and even within the last ten or twelve years I have met birdcatchers who have caught eight or ten dozen in a day, though this must be regarded as exceptional. During 1893-1896 I have frequently known two or three dozen to be caught, and looked upon by the catchers as an average day's work. They are still by no means rare, and breed in the gardens of most of the villages, especially near the fens, where many family parties may be met with in autumn feeding on the thistles that abound in the rough pasture-land.—J. L. BONHOTE (Ditton Hall, Fen Ditton, Cambridge).

Hertfordshire.—Increased very prominently in this county during the last three or four years. — W. PERCIVAL WESTELL (St. Albans, Herts).

Yorkshire—Scarborough.—I have been an observer of birds in rural England for nearly thirty years, as a resident in both southern and northern counties. All the wild Goldfinches I have ever seen would not number a dozen, yet I never go anywhere from home without making a list of every bird seen. A nest of young ones, I have reason to believe, was taken near here in 1897, but I only saw the empty nest, which might have been a Lesser Redpoll's. Here confusion of common names sometimes arises through the Yellowhammer being called "Goldie." My limited experience with this bird may evoke a smile from more fortunate ornithologists. I have, however, spoken of the Goldfinch as I know it.—W. GYNGELL (Scarborough).

Devonshire.—No increase since publication of 'Birds of Devon' (1892). Have not seen any since March, 1893. Mr. E. A. S. Elliott thought at one time the bird was becoming more plentiful near Kingsbridge, but now writes: "There are still a few about. I sometimes see single birds on the coast in spring. It looks as if they had crossed the Channel." Great numbers perished in the severe winters of the last half of the past century. Up to 1880 Goldfinches were taken in considerable numbers by Exeter birdcatchers. — W. S. M. D'URBAN (Newport House, near Exeter).

A Habit of the Lesser Redpoll (Linota rufescens).—With reference to this subject by Mr. Blathwayt (*ante*, p. 26), the following remarks may be of some interest. This is a fairly common breeding species in this part of Cheshire, and I can endorse Mr. Butterfield's assertion (*ante*, p. 72) that it rarely forsakes its nest unless the provocation be great. My impression is that when one of the Finch tribe does desert its nest, it never returns to it for any purpose. To this, as to most things in nature, there may be, and no doubt are, exceptions. I have known a Bullfinch lay four eggs in the same nest from which the two eggs had been taken a week previously, but this, in my opinion, is a rare occurrence. That birds do occasionally remove their eggs there can be little doubt, but whether they place them in new nests or simply make away with them is a difficult matter to prove conclusively. The former seems to me extremely unlikely, as it would involve hiding the eggs temporarily until the new nest was built—a reasoning power which we cannot suppose that birds possess. Though I have found many nests of the Lesser Redpoll in various situations, I never yet came across one in a fir-tree. The site mentioned by Mr. Butterfield must be somewhat unusual, and perhaps peculiar to those localities where conifers abound. No bird, I venture to say, more frequently betrays the whereabouts of its nest, in whatever stage it may be, than the Redpoll; a nest was once brought to my notice by the twittering noise made by the sitting bird.—S. G. Cummings (King's Buildings, Chester).

Nesting Habits of the Lesser Redpoll (Linota rufescens).—May I be allowed to give a little negative evidence on the subject broached by your contributor, whose experiences lead him to suppose that the above-named species easily forsakes her eggs? On June 3rd, 1899, near Scarborough, I found a nest of this bird in a hazel-bush five feet up. It contained three eggs. As I wanted these, I took and replaced them with three eggs of the Whitethroat. Visiting the nest again on June 11th, I found that the Redpoll had laid another egg in the same nest amongst the introduced eggs of the Whitethroat, and was then sitting upon them, all four eggs being considerably incubated. I think this sufficient evidence that at least this individual bird was not very sensitive to interference. I may say that I very rarely tamper with birds' eggs in the way above described, and that I consider it bad form. I have found several other nests and eggs of this species, but have no other evidence to offer on the point raised.—W. Gyngell (13, Gladstone Road, Scarborough).

The Lesser Redpoll in Cardiganshire.—I have hitherto looked upon this species as being decidedly scarce in the Aberystwyth district, and was doubtful whether it nested with us; but, having kept several in an aviary during the past eighteen months, I became familiar with its song and call-notes. The result was that I identified the Redpoll frequently during the past spring, and should now describe it as local, but not uncommon. In one locality some two miles distant, where a neglected orchard enclosed by overgrown hedges offers the additional attraction of swampy ground with willows close at hand, at least half a dozen pairs must have nested. Others seen twenty miles away, near Tregaron, were also in the willows, no doubt collecting down for their nests.—J. H. SALTER (University College, Aberystwyth).

White-tailed Eagle in Suffolk.—Mr. Hudson, the Ipswich bird-stuffer, recently showed me a fine young White-tailed Eagle (*Haliaëtus albicilla*), shot on Feb. 9th within about three miles of the town. A man shooting Wood-Pigeons had propped up a dead one as a decoy, when the Eagle swooped down and began to devour it, thus affording an easy shot to the concealed gunner. The bird was a female, weighing about nine and a half pounds, and had been feeding on Rabbits.—JULIAN G. TUCK (Tostock Rectory, Bury St. Edmunds).

Purple Heron in Hertfordshire.—Whilst in the hands of the taxidermist, I recently examined an immature specimen of the Purple Heron (*Ardea purpurea*) that was shot from the watercress-beds at Castle Farm, near Harpenden, by Mr. George Adams, in November, 1902. It has since passed into the possession of Mr. C. Arnold, of Batford Mills, who has kindly confirmed these particulars.—J. STEELE-ELLIOTT (Dowles Manor, Shropshire).

Variability in Colour in Duck's Bill.—As great interest is at present being taken in the various forms of Geese met with along our shores, which are to a certain extent characterized by the colour and markings of the beak, it may not be out of place to note two instances of variation among Ducks which have recently come under my notice, as showing how little reliance must be placed on those characters for determining races. The first is the case of the Bahama Ducks, in which it was found that among fresh-shot birds the colour of the triangular patch on the bill varied from deep crimson-lake to pale yellow, irrespective of sex. The other instance is that of a Mallard Spot-billed hybrid, which I have in my aviaries. For three years this bird had a black bill with the characteristic yellow spot of the Spot-bill, but last summer the yellow gradually encroached on the black till the latter colour was confined to a stripe along the culmen, and a transverse stripe from the culmen to the edge of the bill; in this state it remained for some four months, when it gradually returned to its former condition.—J. L. BONHOTE (Ditton Hall, Fen Ditton, Cambridge).

The Rock-Dove (Columba livia) inland in Somerset.—In the celebrated Cheddar cliffs the Rock-Dove has its stronghold. It suffers very little molestation from egg-collectors, owing to the inaccessible heights at which it nests, although I have on two occasions secured a pair of eggs. The nests consisted simply of a few twigs on a moss-grown ledge of rock, the eggs being smaller and more spherical than those of the Ring-Dove. I have seen these birds dart out one after the other with great swiftness from the ivy-covered faces of the cliffs at the disturbing sounds of the visitors, or the cries of the Kestrels; and they have doubtless existed here in their pure and wild state through centuries.—Stanley Lewis (Wells, Somerset).

Notes from Aberdeen—January–February.—A rather large flock of Snow-Buntings (*Plectrophenax nivalis*) moving about the whole time. Two Bullfinches (*Pyrrhula europæa*), male and female, appeared on Jan. 12th. A Lapwing (*Vanellus vulgaris*) seen and heard on Feb. 11th, flocks appearing about ten days later, earlier than usual in this neighbourhood. Have noticed attempts by Larks to sing during last days of February, but only heard complete song on the 28th of that month. —W. Wilson (Alford, Aberdeen, N.B.).

Birds killed by Ticks.—On Sept. 1st, 1901, I picked up a young Stock-Dove, fully fledged and nearly full grown, in our wood here. It was in an exhausted condition, only just alive, though well fed, and its crop full of vetch-seed, with a few grains of wheat. On examining it I noticed two large Ticks distended with blood, one above and the other just below the left eye, which was completely destroyed. There were several other Ticks on the head, seven or eight altogether. On the 13th of the same month I found a young Blackcap Warbler lying dead near a fig-tree, the fruit of which is a great attraction for birds, with a large Tick on the throat and another on the forehead. I have picked up scores of dead birds of different species from time to time, but never before noticed any that had Ticks on them.—W. S. M. D'Urban (Newport House, near Exeter).

"Do Wild Birds die instantly?"—The notice of Mr. Wm. Earl Dodge Scott's paper in the 'Outlook' on the above subject in the last number of 'The Zoologist' (*ante*, p. 79) reminded me of a singular occurrence in California at the end of December, 1886. I was living near Goleta, in Santa Barbara County, and had daily occasion to pass by a certain field. For several days I had seen on the opposite side of the field what looked like a burnt stump, but took no further notice of it, until one day, having my dogs with me, they rushed across the field, and commenced barking furiously around the object I had seen.

My curiosity being aroused, I crossed the field to investigate the matter. On reaching the spot I was surprised to find it was a Turkey Buzzard (*Cathartes aura*) squatted on the ground and unable to rise, and I discovered it was in a semi-paralytic condition. I carried it home and placed it in an outhouse, where it remained for several days more, when, finding it did not recover, I killed it. On removing the skin I could find no injury, though there were several pellets of dust-shot just under the skin, but nothing to account for the helpless condition of the bird. The whole body and the intestines were covered with fat to a surprising degree. On opening the stomach I found inside it a very small revolver or pea-rifle bullet which had been flattened by striking against some hard object. There was no perceptible wound nor any inflammation of the coats of the stomach, which had nothing else in it but a small quantity of dark green fluid. I imagine the bird had swallowed the bullet when devouring some dead animal, probably a "Squirrel" (*Spermophilus grammurus*), a most destructive rodent existing in vast numbers all over California, notwithstanding that every man's hand is against it. The farmers' boys constantly practise with pea-rifles at these "Squirrels," and they are also destroyed wholesale by the use of strychnine on most of the large ranches. Possibly the Turkey Buzzard had swallowed some of this poison, which has led to the almost complete extermination of the noble Californian Condor (*Pseudogryphus californianus*) in Santa Barbara County. The carcases of dead Sheep were poisoned to destroy Coyotes, but were eaten by the Condors. The great length of time—over a week—the unfortunate Turkey Buzzard lived without feeding struck me as strange, though I have known hens, when sick, live for a long time, although refusing food.— W. S. M. D'URBAN (Newport House, near Exeter).

NOTICES OF NEW BOOKS.

In the Andamans and Nicobars; the Narrative of a Cruise in the Schooner 'Terrapin,' with Notices of the Islands, their Fauna, Ethnology, &c. By C. Boden Kloss. John Murray.

We recently drew the attention of our readers to another volume, by Dr. Alcock, on the zoology of this region, which was almost entirely devoted to the fauna of the Indian Seas; the present work describes the principal islands in the Bay of Bengal—the Andamans and Nicobars—with a very full account of their human inhabitants, and some scattered information as to other animal life. Although the nearest islands of the Nicobar and Andaman groups are only separated by a distance of eighty miles, the divergence in fauna and flora is most profound. In mankind there is not a simple difference of race, but a real distinction in type; whilst the coconut palm—such an abundant feature of the Nicobars—is, with the exception of the Cocos Islands, absent from the Andamans in a naturally propagated condition. We mention these two examples as indicative of what occurs in both faunas, and floras, in numerous other though less marked instances. Even in the Nicobars, the Monkey (*Macacus umbrosus*) does not extend to a more northerly island than Kachal, and Mr. Kloss remarks on "the absence of this genus from the Andamans," although in a subsequent synopsis of the mammalian fauna of the two groups, as given by Mr. Gerrit S. Miller, *M. coininus* (evidently a misprint for *M. leoninus*) is given as inhabiting the South Andaman, though almost certainly introduced.

Anthropologists will welcome this book; its photographic illustrations of the Nicobarian inhabitants will alone render it notable to that science. The British Eclipse Expedition which visited Kamorta in 1875 also took some excellent photographs, to which those now provided by Mr. Kloss will prove a valuable supplement. The Anthropological Institute in 1877 published a preparatory list of publications relating to the Nicobars, most of which seem to be referred to by Mr. Kloss, who has moreover, himself, given a useful summary of many writings relating to these islands from the time of Ptolemy. Of all the ethnological illustrations, none are of more interest than those of the Shom Peṅ, who inhabit the interior of the Great Nicobar. These people were till recently only known by report and tradition, and were on those grounds usually considered as of the Negrito race. Dr. A. B. Meyer, in his classical work on the Negritos, had, however, shown the hypothesis to be untenable, or at least unproved; and now the photographs of Mr. Kloss have given absolute contradiction to the supposition.

The "headmen" of the Nicobar Islands have a partiality for taking the names given to them by traders, and others who visit them. The Editor of this Journal, who spent some weeks at Kar Nicobar in 1868, is naturally somewhat astounded to read —and after an interval of thirty-three years—that among other celebrities, as Sam Weller, Tom Noddy, Corney Grain, &c., a Nicobarian still does him the honour to bear his name, even to the correct initials.

Text-Book of Palaeontology. By KARL A. VON ZITTEL. Translated and Edited by CHARLES R. EASTMAN, Ph.D. Vol. II. Macmillan & Co., Limited.

IN our volume for 1900 we published a notice of the first volume of this excellent translation, which was altogether restricted to the Invertebrata; the present volume, devoted to the Vertebrates, carries on the subject as far as the class *Aves*, while the treatment of the *Mammalia* is reserved for a third and final volume.

Although the authority of Zittel is pre-eminent in palæontology, still time, with the facts of fresh discoveries, is always demanding new and revised editions of the most canonical writings. With the concurrence of the author this course has been considerably pursued with the present volume; Dr. Smith Woodward has translated and revised the class Pisces; Dr. E. C. Case, of Wisconsin, has performed the same duty with the

Amphibia; and other good authorities have assisted with remaining groups. Prof. Marsh was to have revised the *Dinosauria*, but this was prevented by the regretted death—or, as Mr. Eastman writes, "the final passing"—of that distinguished palæontologist.

This book is one for recognition rather than criticism. It is one to which the zoologist may safely refer for nearly the last word on palæontology, and as such is a, or rather the, recognized authority. Criticism can only be advanced by specialists on special groups, and does not affect the main thesis. The volume is now of a greater necessity to zoologists than it would have been formerly. Zoology has become less restricted to a knowledge of what is living, apart from what is dead; to the present, without reference to the past. Palæontology—even with the imperfection of the geological record—is our principal key to the method and course of evolution, and in a purely zoological and taxonomic sense we may say with Wordsworth, and with a biological meaning, "Our birth is but a sleep and a forgetting."

Zoological Wall-Tables. Drawn and Edited by PAUL PFURTSCHELLER, Ph.D. A. Pichlers Witwe & Sohn, Vienna and Leipsic.

WE have received Tables 4 and 5 of this series, intended for the use of schools—where higher zoology is taught—and science teachers. Tab. 4 represents *Mustelus vulgaris*, the ordinary species of the genus, and the most frequently found smooth-skinned Shark in the Mediterranean. This diagram is large, and portrays a female specimen with its ventral side opened, exhibiting the viscera and internal structure, and surrounded by sectional illustrations. One, magnified six times, shows the egg of a Scyllium, with the embryo just emerging, and wearing the large vitelline bag. Tab. 5 relates to the Echinoidea, and to *Sphaerechinus* sp., and by the ample size shows not only the internal anatomy, but also details of its complicated external structure. These large wall-tables are coloured, thus drawing attention to the principal organs, and are accompanied by descriptive leaflets printed in the English language, which should prove useful alike to scholar and teacher.

EDITORIAL GLEANINGS.

We have received from Mr. R. M. Dixon, of Bombay, a reprint of his paper on "The Senses of Snakes" (Verhandlungen des V. Internationalen Zoologen-Congresses zu Berlin). We give the following extract:—

"The organ of hearing in the Snakes is so obscure and defective as to lead one to believe that their sense of hearing was of varying delicacy, if not altogether wanting. Snakes possess not only no external ears for gathering and concentrating the vibrations of sound, but are also destitute of any external orifice by which these may readily enter the auditory organ. They have no tympanum and no traces of the Eustachian tubes. The tympanic cavity also is absent, and in its place there is a long columellar rod, Columella auris, with a special cartilaginous pad at its outer end, which plays against the middle of the shaft of the quadrate bone. This peculiar anatomical structure presumably produces a loud rumbling noise in the internal ear, as the fenestra ovalis is directly affected by the vibrations produced at every motion of the quadrate bones during deglutition. Hence there is reason to believe that Snakes can hear as distinctly as any other animals, though the auditory apparatus in the *Ophidia* is obscure and imperfect. The velocity of sound in the earth is far greater than that in air. Hence the vibrations of a sound mainly transmitted through the earth—as, for instance, the sound of a footfall—may reach a Snake on the ground quicker than one coiled up in the branches of a bush. In the same way the vibrations of a sound mainly transmitted through the air may reach the latter earlier than the former. The undulations may also be transmitted through the medium of water. The velocity of sound in water is four times as great as in air. Thus the vibrations of a sound transmitted through the medium of the earth, water, or air reach the essential organ of hearing whether the Snake is basking in the sun, swimming in the water, or lying coiled up in the branches of a bush. In Psalm lviii. 4, 5, Eccl. x. 11, and Jeremiah viii. 17, allusion is made to that singular phenomenon, the charming of Snakes by musical sounds. The Psalmist compares the wicked to 'the deaf adder that stoppeth her ear; which hearkeneth not to the voice of charmers, charming never so wisely.' According to Indian folk-lore there is a common belief among the natives that the Nag or Cobra (*Naja tripudians*) is always a male, and that the Nagin, or female, is the graceful Snake (*Zamenis gracilis* or *Z. fasciolatus*). A similar belief probably prevailed throughout the East, and the Psalmist's 'deaf adder' was perhaps some Snake popularly believed to be the mate of the African Cobra (*Naja haje*), a frequent subject for Snake-charming in Palestine. At any rate, the proverbial 'deaf adder' possessed the organ of hearing, and yet she stopped her ear and paid no heed to the music which apparently fascinated other Snakes. The Snake-charmers of Egypt and India have been known from the earliest period. The mantras or incantations of these men have really no influence on other Snakes except over the reptiles trained to obey their call. The Cobra's fondness for music has been reported from time immemorial. The snakeman perhaps improves upon this natural instinct, and after a few weeks' training succeeds in teaching the reptile to keep time with the waving of his musical instrument."

A DISCUSSION recently took place in the pages of the 'Athenæum' on a remark made by Sir David Hunter-Blair, that there was absolutely no mention of Fireflies in all the writings of antiquity. In opposition to this statement Dr. S. Birdwood has given the following quotations:—

Aristotle, 'History of Animals,' iv. 1, 3: "The glowworm [πυγολαμπίς] is both winged and wingless"; and v. 17, 7: "The wingless glowworm has its beginning in a little, hairy, black grub." Both quotations probably refer to *Lampyris noctiluca*, the *mouche lumineuse* of the French.

Pliny, 'Natural History,' xi. 28 [34]: "The glowworm [*lampyris*] emits from its side at night a light like that of fire, bright at the instant it opens its wings, and again extinguished in darkness at the moment it closes them"; and xviii. 26 [66]: "The signal of the ripening of barley and for the sowing of millets is one, the shining of the 'cicindelæ,' so the rustics call them, but the Greeks 'lampyrides.' How boundless is the bounty of Nature!" Both these passages undoubtedly refer to *Lampyris italica*, the *lucciole* of the modern Italians.

Dr. R. Garnett has also added to our information on this question:—

After reading Sir David Hunter-Blair's letter, I turned to Forcellini under *cicindela*, and found him citing Pliny, lib. xviii. cap. 66: "Lucentes vespere per arva cicindelæ; ita appellant rustici stellantes volatus, Græci vero lampyridas." Referring to the passage to ascertain whether Pliny had said anything further, I was rewarded by encountering a fine burst of rhetoric, even though the point of view be rather that of utility than of beauty :—

"Extremo autem hoc tempore [that of the first visible rising of the Pleiades about the second week in May] panici miliique satio est. Incredibili benignitate naturæ! Jam Vergilias in cœlo notabiles caterva fecerat ; non tamen his contenta, terrestres fecit alias, veluti vociferans, Cur cœlum intuearis, agricola? Ecce tibi inter herbas tuas spargo peculiares stellas, easque vespere et ab opere disjungenti ostendo, ac ne possis præterire, miraculo solicito. Habes ante pedes tuos ecce Vergilias."

In another place (lib. xi. cap. 34) Pliny speaks of Fireflies under the name *lampyrides*: "Lucent ignium modo noctu, laterum et clunium colore, [candore ?] lampyrides, nunc pennarum hiatu refulgentes, nunc vero compressu obumbratæ ; non ante matura pabula aut post desecta conspicuæ." It will have been observed that, although he begins by representing the *cicindelæ* as winged insects, he ends by describing them as creeping among the grass. It would seem that he confused the firefly with the glowworm, following the authority of Aristotle, who says, as quoted by Pliny's commentators, that some *lampyrides* are winged and others wingless, just like ants.

MR. J. A. HARVIE-BROWN has reprinted, in a complete and convenient form, his series of articles published in the 'Annals of Scottish Natural History,' 1902–3, "On the Avifauna of the Outer Hebrides, 1888–1902." This now constitutes an important booklet on Scottish ornithology, and one that can be catalogued as a separate publication, which is no small boon to a naturalist with congested book-shelves.

A PAPER originally published in the 'Century Magazine' (1900) by Mr. Ernest Thompson Seton, on the "National Zoo at Washington," has just been republished in the last Smithsonian Report (1902). Besides some beautiful illustrations, there are many original remarks in the text. As regards the extinction of any animal life, more especially of the early progenitors of our domestic animals, Mr. Seton remarks that if the early hunters "had succeeded in exterminating them before their stock was domesticated, which might easily have been, for domestication succeeds only after long and persistent effort and, in effect, a remodelling of the wild animal by select breeding, the loss to the world would have been a very serious matter, probably much more serious than the loss of any invention, because an idea, being born of other ideas, can be lost but temporarily, while the destruction of an organized being is irreparable."

'Hull Museum Publications,' No. 10, contains an account of the discovery of a nearly complete skeleton of *Ichthyosaurus thyreospondylus* from the Kimeridge clay of East Yorkshire. We also read that Mr. George Swailes, of Beverley, has presented the collection of eggs of British breeding birds formed by his brother, the late Mr. Johnson Swailes. "This represents twenty years' collecting by an enthusiast, and includes several interesting and rare specimens, besides being of great local value. It is to be hoped that Mr. George Swailes's excellent example will be followed by others in the district owning collections of this nature, and that the Hull Museum will be looked upon as their proper home."

Two recent records have created no inconsiderable interest among British ornithologists. What is apparently the fourth example of White's Thrush (*Turdus whitei*) recorded for Yorkshire has just been placed in the Halifax Museum, having been shot in Luddenden Dean, near Halifax, on Dec. 18th last. A full and illustrated account has appeared in the 'Halifax Naturalist' for February. A reproduction of this figure will also be found in 'The Naturalist' for March.

The second record relates to the breeding of the Red-necked Phalarope (*Phalaropus hyperboreus*) in Ireland. An account of this interesting occurrence from the pen of Mr. Edward Williams will be found in the 'Irish Naturalist' for last February.

The 'Concilium Bibliographicum,' to whose excellent work we have previously referred, has just issued its general statement for 1902. The 'Concilium' has surmounted many difficulties, and becomes yearly a still greater boon to zoologists. A conflagration destroyed towards the end of the summer 61,250 printed cards, which were ready for distribution to subscribers. The full value being covered by insurance, no financial loss was incurred; but the number of cards issued in the course of the year was correspondingly reduced. We extract the following paragraph relating to Supplementary Cards:—

"1. Minor notes. Ever since the foundation of the 'Concilium,' two incompatible desiderata have been expressed by various subscribers in regard to the completeness of our entries. On the one hand, it is claimed that the admission of every little field-note into a bibliography such as ours is an impediment to research, instead of being an aid, and we are urged to suppress references which appear to have no scientific value. On the other hand, other subscribers warn us against such suppressions, and declare that we may as well abandon entirely the attempt to record the observations on the fauna of Europe and America, if minor notes are to be excluded. It has been particularly pointed out that studies on the gradual spread of an insect require references to the most trivial notes. Heretofore the 'Concilium' has wavered between these two tendencies, but in 1902 it was decided to establish a supplemental bibliography, which those desiring complete references can especially order. It is manifestly quite unimportant to a subscriber in Australia or in America whether an insect previously known only in Kent is discovered in the neighbouring county of Sussex, but for the student of the fauna of the southern counties of England it is of great importance. True to its principles, the 'Concilium' now leaves it to each subscriber to decide whether minor notes shall be included or not. It is allowed, moreover, for a subscriber to include the British references alone, or those concerning Australia, or America."

The headquarters is still Zürich-Neumünster.

In 'Nature Notes' for last January, Dr. Herbert Snow contributes a query on "The Influence of Maternal Impressions on the Offspring." The author refers to the old episode narrated in *Genesis* of Jacob's experiments on Laban's cattle; he also writes:—"It is fashionable nowadays to scout the more extraordinary and exceptional manifestations of the principle." The question he propounds is this:— "Is the colouration, &c., of birds, of the lower mammals, even of fishes, affected by the natural environment of the mother, particularly so far as that concerns her visual sense? And, if so, to what extent? For example, how far may the colour of a Grouse be ascribed to the prevailing tints of the heather amid which the bird lives? Are not the stripes of the Tiger in part due to the vision ever present to the maternal eye of tree-trunks, with the sun glinting through them? The white plumage of the Ptarmigan and Snow-Bunting, the tawny yellow of the Lion, the sandy-coloured Snakes of the Egyptian desert, the Sand-Grouse, the dead-leaf-coloured Woodcock—one need not multiply such instances hitherto ascribed to the survival of the fittest in the struggle for existence, and to that alone."

At the meeting of the Zoological Society, held on March 3rd, Mr. Rudolf Martin read a paper on some remains of the Ostrich (*Struthio karatheodoris*), found in the Upper Miocene deposits of Samos. The author stated that the existence of an Ostrich in Samos was of interest because a comparison of the fauna of Samos with that of the Siwalik Hills showed that the latter was younger, and consequently *S. karatheodoris* was of a greater geological age than *S. asiaticus*. The hypothesis, therefore, that the family of Ostriches had been developed in Southern Eurasia and emigrated at a later period to Africa and Southern Europe could not be sustained. The discovery of *S. karatheodoris* in Samos showed rather that the specialization took place in Africa, and that the existence of such forms in India and Southern Europe was due to a secondary immigration from Africa. Most probably, however, there was the same relationship between the whole fauna of Samos and that of the Siwalik Hills—*i. e.* the latter was a transformed and later generation of the former.

We have received 'The Census of the British Land and Freshwater Mollusca,' by Lionel E. Adams, published by authority of the Conchological Society of Great Britain and Ireland, and issued by Dulau & Co. We extract the following pars. from the prefatory remarks:—

"It would be superfluous to point out the value of a complete Census showing the distribution of each species, and it is to be hoped that the present publication of the Census up to date will show conchologists where the gaps are that need filling up, and encourage them to assist in the work. It will be noticed that Scotland is still very poorly explored, but that the Irish lists, on the other hand, are now very fairly full, mainly through the exertions of Messrs. R. Welch and P. H. Grierson. It will be remembered that the last Census, which was published in my 'Collectors' Manual of British Land and Freshwater Shells,' in 1896, was the compilation of Messrs. W. Denison Roebuck and John W. Taylor—a monument of valuable labour. The great merit of the system of authentication is the uniformity of value which it gives to the records, all specimens passing under the eye of the recorder. It does not follow that other records are not equally reliable, but for the sake of uniformity of value it is necessary to confine the tables to such records as have been submitted to and passed by the Society's Referees, otherwise a wide door would have been opened to errors of determination, the avoidance of which is the object aimed at in instituting the authentication system. The areas adopted are those proposed by Dr. H. C. Watson, and used by him in working out the distribution of the British Flora. It is deemed sufficient to confine the tables to the distribution of species, that of varieties being for many reasons impracticable at the present time.

"Conchologists who can furnish specimens for completing these tables are requested to send them to the Society's Recorder, Mr. Lionel E. Adams, 68, Wolverhampton Road, Stafford."

"The Significance of the Condition of Young Birds at Birth" is the title of a paper contributed by Mr. W. P. Pycraft to the 'Popular Science Monthly' for last December. As is well known, both systematic ornithologists and philosophical zoologists have based theoretical views on the importance of the development in which young birds are hatched: (1) according to their helplessness or otherwise, and (2) according as they are clothed or otherwise. Mr. Pycraft concludes:—"That too much stress has been laid by systematists on the condition of the young birds at birth is admitted. It is further maintained here that its significance has been misunderstood, and that the facts now brought forward are strong enough, on the one hand, to refute the older views, and, on the other, to justify the theory—firstly, that birds were originally arboreal, and their young nidifugous; secondly, that nidicolous habits and helplessness of young birds are specialized adaptations to an arboreal or gregarious mode of life; and, thirdly, that the young of gallinaceous birds form a link in the chain of the evolution of nidifugous habits. The free finger-tip and arrested development of the outer quill-feathers point to a prior arboreal habit, whilst the accelerated development of the inner quill-feathers indicates an adaptation to enable the young to escape from the enemies surrounding a terrestrial nursery. The third and last stage is represented by the protective coloration, a device which has been almost universally adopted by nidifugous birds, owing to its greater effectiveness."

Our old friend the "Sea-Serpent" is again receiving attention. This time M. Trouessart writes in the 'Revue Scientifique' (March 7th) on "Réapparition du Grand Serpent de mer." He refers to a recent communication made to the Société Zoologique de France by M. Racovitza, naturalist to the "Belgica" Antarctic Expedition, a communication we have not yet seen. M. Trouessart examines the records, and of course states that whatever the unknown animal may be, it is certainly neither a serpent nor reptile of any kind. He inclines to the opinion that some of the appearances denote a "mammifère," resembling the "Pinnipèdes."

WE have elsewhere (*ante*, p. 111) referred to literature relating to the Negrito race of mankind. We are glad to see from 'Le Mois Scientifique' that a new and popular edition of M. de Quatrefages' well-known work is now published:—

"'Les Pygmées, les pygmées des anciens, d'après la science moderne, les négritos, les négrilles, les hottentots et les boschimans,' par A. DE QUATREFAGES, professeur au Muséum, membre de l'Instit. 1 vol. in-16 de 352 pages, avec 31 figures: 2 fr."

ACCOUNTS have been received by the "Friends' Foreign Mission Association," that Bubonic Plague has broken out at Hoshangabad, India. Besides the loss of life and the hindrance to the industrial and other works of this excellent Association, we are informed: "So far we have found no dead Rats, but have plenty of live Squirrels, which is considered a good sign." This relates to the compound where a large number of girl orphans are housed. At Rasulia, however, where the works are situated, and where the outbreak has been greater, numbers of dead Rats and Squirrels are found. It is alleged that fleas carry the contagion.

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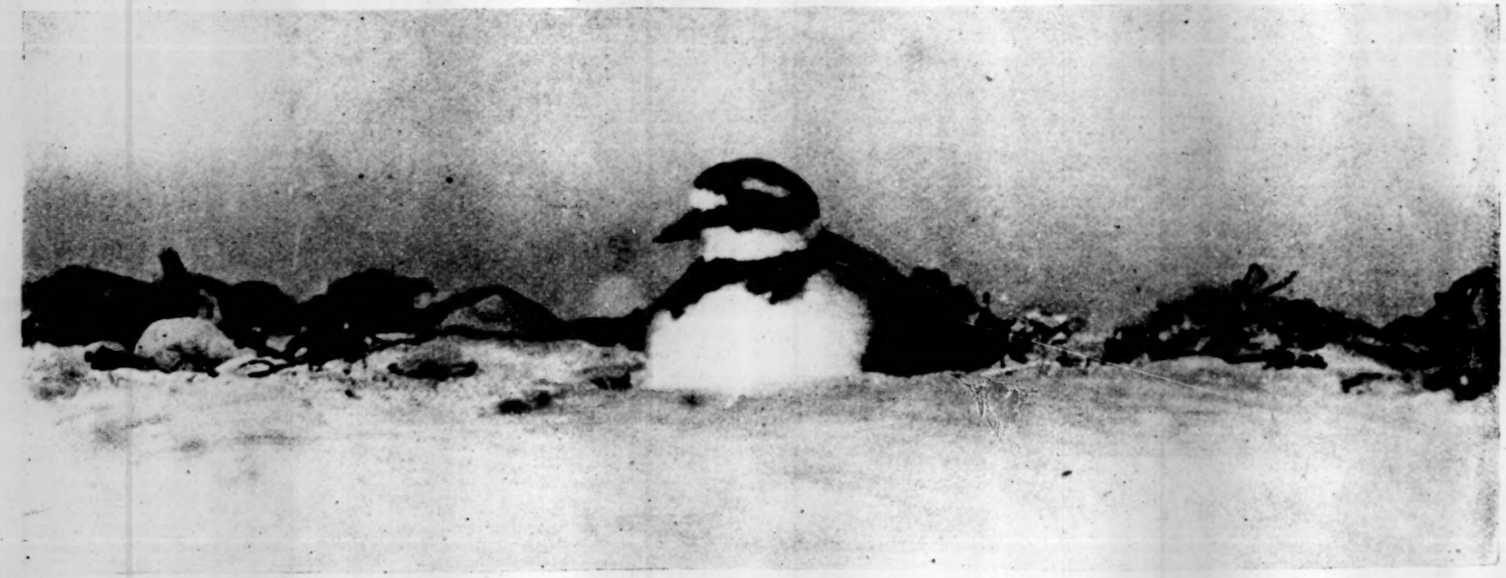

RINGED PLOVER (*Ægialitis hiaticula*) ON NEST (*cf.* p. 130).